

ABSTRACT OF THE DISCLOSURE

An imaging system for white light and fluorescence endoscopy that includes an automatic gain control circuit 30 that adjusts the brightness of an image produced based on distribution of pixel intensities in one or more video frames. The magnitude of the image signals produced by a pair of high sensitivity imaging devices such as intensified CCD transducers are compared to a number of reference thresholds. A time-over-threshold counter (112) determines the number of pixels in the image signals having magnitudes greater than or less than the reference thresholds. The distribution of pixel intensities is supplied to a decision tree algorithm (116) that determines whether the gain of the intensified CCD transducers (44a, 44b) used to produced the autofluorescence images or the intensity of the excitation light produced by a light source (36) should be increased or decreased. In addition, a mode switch mechanism is provided to change rapidly from the fluorescence imaging mode to the white light imaging mode or vice versa. This mechanism includes provisions to prevent the accidental application of reflected white illumination light to the image-intensified CCD transducers. Proximity switches (192, 194) monitor the position of a light directing mechanism such as a mirror (186) to allow light to pass to fluorescence camera head (42) or to a color video camera head (46). The light source is not switched to produce white light until it is known that the mirror is in position to direct the reflected light to the color video camera head. Finally, the present invention produces a quantitative display of the relative intensities of the autofluorescence light produced in a pair of spectral bands.